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ADDITIONAL NOTES ON THE AMPHISBAENIDS OF GREATER PUERTO RICO

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The overall faunal similarity of Puerto Rico and the Virgin Islands has led to the use of the term "Greater Puerto Rico" for their combined areas (Schmidt, 1928, used the term for a supposed continuous land mass of the past). The amphibaenids of this region have been dealt with thoroughly by Gans and Alexander (1962), in their comprehensive work on the Antillean members of the family. More recently, Gans (1964) has described a new species, *Amphisbaena schmidtii*, from Puerto Rico. Thorough as it has been, the work of these authors has been hampered by a dependence upon specimens with insufficient or doubtful locality data.

Herpetological and ornithological collections made under the sponsorship of Dr. Albert Schwartz in the Virgin Islands (summer, 1964) and Puerto Rico (January-March and July 1965, and previous visits) have added new data to the knowledge of the distribution, taxonomy and ecology of the Greater Puerto Rican amphisbaenids with many new specimens and one new species.

PHYSIOGRAPHIC FEATURES OF PUERTO RICO

Before proceeding with the discussion of the species, a brief outline of the major physiographic features of the island of Puerto Rico is pertinent. Puerto Rico may be broken into three general physiographic regions, each of which is, in a broad sense, ecologically uniform.

1. The northern limestone region extends west from roughly the city of San Juan to the western extremity of the island at Aguadilla. This region at its extreme width is one-third that of the island. Most of it is occupied by an extremely eroded topography of close set, conical *mogotes* (to above 1500 feet), often called the Haystack (or Pepino) Hills; but some areas of it are

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Fig. 1. Map of Puerto Rico showing new locality records for *A. caeca* (solid circles), *A. bakeri* (circles with circles with crosses), and *A. schmidtii* (hollow circles). The known range of *A. bakeri* based on previous and present records is indicated by coarse diagonal lines; the range of *A. xera* by fine horizontal lines; and the range of *A. schmidtii* by fine horizontal lines. The arrow indicates Caja de Muertos.

rolling or flat, especially along the coastal margin. The termination of this region to the south is usually abrupt and frequently evident as an escarpment. This limestone region varies from xeric to mesic; parts are moist enough for the growing of coffee.

2. The central highlands, primarily igneous in lithology, comprise the main mass of the island and are composed of a very complexly subdivided system of mountains in which few major units or trends are evident. Heights range to over 4000 feet in places, but generally the elevations are moderate (1000-2000 feet). Except for the eastern and western coastal margins it is predominantly mesic and at one time was doubtless almost completely forested.

3. The southern coastal plain is directly continuous with the central highlands but is in contrast ecologically in its aridity. Outstanding faunistically in this region is the area to the south of the Valle de Lajas in the extreme southwest; it is comprised in general of a discontinuous range of low coastal hills, which at one time probably constituted a chain of offshore keys or a peninsula joining the main island in the vicinity of Guayanilla. This southern coastal region, particularly the portion just mentioned, is probably the strongest area of endemism in Puerto Rico, where such forms as *Phyllodactylus wirshingi*, *Sphacrodactylus roosevelti*, *Ameiva wetmorei*, *Anolis poncensis*, *Anolis cooki* (= *A. cristatellus cooki* Grant), and the very distinctive *Typhlops granti* have their primary distributions.

SPECIES DISCUSSION

AMPHISBAENA BAKERI Stejneger

Specimens examined; new localities: PUERTO RICO: 4.2 km S Mora, 500' (150 m), ASFS V5335; 7 km W Maricao, ca. 300 meters, ASFS V6424. *Previously recorded localities:* "Las Marías," MCZ 66512 (= UPR 1?); "Maricao," MCZ 66513 (= UPR 2?); "Mayagüez," UMMZ 55824.

Amphisbaena bakeri is known only from a few specimens (12 including the new records cited herein) from a cluster of localities in the north-central portion of extreme western Puerto Rico (Fig. 1). The previous localities for this species were all merely town names. From some of the localities were also recorded specimens of *cacca*, but due to the imprecise nature of the localities, it could not be determined whether the two forms were truly sympatric. *A. cacca* was unknown from the northwestern

corner of the island, and the only localities from which it was known "with" *bakeri* were those which were possibly peripheral to the range of *bakeri* (cf. Gans and Alexander, 1962, fig. 4).

A. bakeri differs from the wide-ranging *A. caeca* principally in being larger in size, in having a higher number of body annuli, longer internasal suture, absence of a third row of chin segments, and lack of caudal autotomy (Gans and Alexander, 1962). Only the second (although possibly the third) has been recognized as an absolute difference from *caeca*. The specific distinctness of *bakeri* has therefore not been established with certainty.

One of the recent specimens (ASFS V5335) represents only a minor range extension but constitutes the first record from the northern limestone region; ASFS V6424 is from within the previously known range. There is no evident explanation for the small, very restricted, apparent range of *bakeri*. The fact that a number of specimens of *caeca* (and no *bakeri*) were collected in the vicinity of Utuado indicates that *bakeri* probably does not occur much farther east than it has been previously reported.

The coloration in life of these two specimens of *A. bakeri* was noted as being "pale pinkish gray"; ASFS V6424 was noted as being "pink below" (ventrally). The right hemipenis of ASFS V6424 is everted and appears to be very similar to the hemipenis of *A. caeca* (Fig. 2).

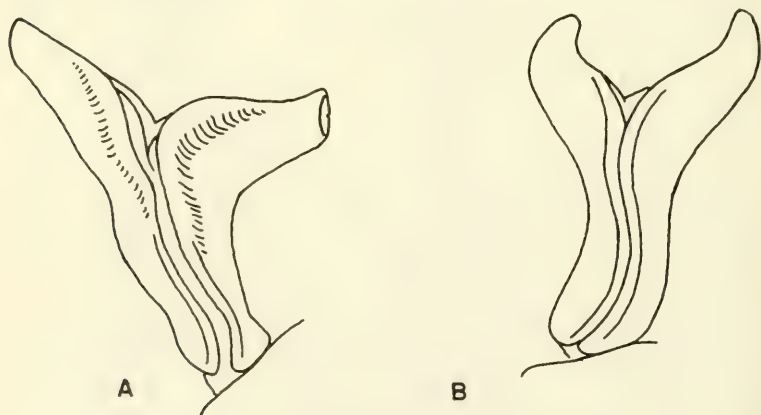


Fig 2. Hemipenes of *A. Amphisbaena schmidtii* (ASFS V5871), and *B. Amphisbaena caeca* (ASFS X4111); view cephalad with organs normal to body axis.

ASFS V5335 from the northern limestone region was collected in a small grassy pasture, which formed the bottom of a doline in a mesic portion of the Haystack Hills. It was found beneath a rock where it was seen disappearing into a vertical burrow in moist clayey soil from which it had to be dug. ASFS V6424 was taken in a typical coffee producing area of the central highlands. It was found in a rotten log along the edge of a clearing overgrown with short, weedy vegetation. The nature of the ecological preferences of *bakeri* cannot, of course, be judged from just two encounters. The locality for the first specimen (4.2 km S Mora) is clearly within the range of *caeca*, the nearest locality for that species being less than three kilometers to the south. *A. schmidtii* also occurs in this part of the limestone hills; the nearest locality for that species was 0.2 kilometers to the north of the locality for the first specimen of *bakeri*. Thus, in this area, the three known Puerto Rican species occur sympatrically, whatever their ecological preferences (see below for *caeca* and *schmidtii*).

AMPHISBAENA CAECA Cuvier

Specimens examined: new localities: PUERTO RICO: 13.3 km E Utuado, ASFS V4443-48; 17.7 km NE Utuado (= approx. 8 km straight line distance), 1100' (335 m), ASFS V4482, V4499, V4500-01, V4623, V4449, V5860; 8 mi. (13.5 km) NW Utuado, 1500' (407 m), ASFS V4548; 9 mi. (15 km) E Lares, ASFS V4656; 7.0 km S Mora, 800' (244 m), ASFS V5152, V5329, V5332; 5 mi. (8 km) NE Lares, 1200' (366 m), ASFS V5267; Ramey Air Force Base, Rifle Range Beach, ASFS V5430-31; 2.3 km E Juana Díaz, 200' (61 m), ASFS V5755; 3 km NE San Germán, ASFS V6407; 4.6 km W, thence 4.6 km NW Juana Díaz, ASFS V6620-28, V6631-35; 3.6 km W, thence 9.7 km N Juana Díaz, ASFS V6658-59; 3.6 km W, thence 8 km N Juana Díaz, ASFS V6660-61; 10.2 km E Dos Bocas, ASFS V5861-62; 18.8 km SW Arecibo, 800' (244 m), ASFS V5908-09; 11.2 km NW Utuado, 1300' (400 m), ASFS V5922; 1 mi. (1.6 km) NW Dorado, ASFS V5939; 4.1 km NE Villa Pérez, 2200' (670 m), ASFS V5973; 2 km NE Barranquitas, 2100' (640 m), ASFS V6027; 1.8 km S Adjuntas, ASFS V6207; 12.3 km SE Patillas, ASFS V4798; 10 km SE Patillas, ASFS V4802; 12.9 km SW Fajardo, 800' (244 m), ASFS V5081. VIEQUES: Cayo de Afuera, ASFS V6168. *Previously recorded localities:* PUERTO RICO: Isla Verde, ASFS X937-43, X4104-

25, X7381-98; 2.2 mi. SW Sabana, ASFS X7433-34; Mayagüez, UPR 84c, 87, 88, 90, 92, 140.

Large numbers of *A. caeca* were examined by Gans and Alexander, but they had large series from the eastern part of the island only and relatively few specimens from the west. The species was not then known from the northwestern corner, an area bounded roughly by Mayagüez, Lares and Arecibo. The present collection also has an eastern bias due to the large series from Isla Verde, but a more thorough coverage has been made in the west, including the formerly blank northwest portion.

With the new material I have not undertaken a detailed analysis of trends such as that done by Gans and Alexander (fig. 29). However, I have compared trends in number of body annuli of selected eastern (Isla Verde and east), central (Juana Díaz region), west central (Utua-do-Adjuntas region), and western (Ramey Air Force Base to south of Mora) "samples" (these do not include all specimens examined) with those shown by Gans and Alexander for this character (in which the strongest trends were evident). An agreement in direction of trends was found. Both pre- and posteloacals average fewer in eastern specimens; this is also in agreement with the observations of Gans and Alexander. Additionally, internasal suture length (expressed as a fraction of interprefrontal suture length) averages longer in the eastern specimens.

The largest specimen (ASFS V6207) is a male that measures 291 mm total length (tail 21 mm), which appears to be the largest *caeca* recorded (the largest seen by Gans and Alexander was 269 mm total length). A body annulus count of 214 (ASFS V4120) is lower than the low value of 217 recorded by Gans and Alexander.

The Vieques specimen is, in a way, the first record for that island. The specimen was not taken on the main island but on an offshore key, Cayo de Afuera. However, the species may be assumed to occur on Vieques proper. It has long been a matter of speculation as to which species of *Amphisbaena* would be found on Vieques and Culebra, *caeca* or *fenestrata*. Some have tacitly assumed the former. Of course, the finding of one species does not preclude the possibility that the other might also occur on the island. The Cayo de Afuera specimen has a high number of ventral midbody segments; it is also near the upper extreme of *caeca* in body annuli.

A. cacca seems to prefer a mesic, usually shady, habitat (see below for comparisons with other species); it occurs from montane *cafetales* at elevations of at least 2200 feet (ASF S V5973, apparently the highest elevation record for *cacca*) to the coast. It still appears to be absent from the extremely arid southern regions; the record of Fowler (1918) for Guánica probably does not pertain to this form (*vide infra*). One specimen (ASF S V4798) was collected approximately 40 feet from the ocean's edge and shed skins were found in the vicinity. Three specimens were collected in rotting wood, two in logs that were not even in firm contact with the ground. The most xeric habitat in which I have found *cacca* was on Cayo de Afuera; even there it was in a wooded and somewhat shady, although not moist, situation.

AMPHISBAENA XERA new species

Holotype: MCZ 81019, an adult male from 7 km E of Guánica, Puerto Rico, elevation 600' (183 m), one of a series collected on 6 March 1965 by Albert Schwartz and Richard Thomas.

Paratypes: PUERTO RICO: UIMNH 56910, ASF S V5646, USNM 152588, 7.3 km E Guánica, 2 March 1965, R. Thomas; ASF S V5659, 7.1 km E Guánica, 3 March 1965, R. Thomas; ASF S V5662, 7.3 km E Guánica, 3 March 1965, R. Thomas; ASF S V5722-23, AMNH 94170, same data as type (foregoing localities are at the same elevation as that of the type); UMMZ 73844, Sabana Grande; ASF S V5800, 6.2 km E Juana Díaz, 10 March 1965, R. Thomas; ASF S V6408, 5 mi. (8 km) ESE San Germán, south slope Cerro Algarrobo, 9 July 1965, R. Thomas; ASF S V6148, 5 mi. (8 km) ESE San Germán, south slope Cerro Algarrobo, 10 July 1965, R. Thomas; ASF S V6423, 1.5 km WNW San Germán, 11 July 1965, R. Thomas; ASF S V6427, 3 km NE San Germán, 12 July 1965, R. Thomas; ASF S V6587, 2.3 km E Juana Díaz, 26 July 1965, R. Thomas; ASF S V6616-18, 4.6 km W, thence 1.1 km NW Juana Díaz, 27 July 1965, R. Thomas; ASF S V6619, 4.6 km W, thence 4.6 km NW Juana Díaz, 27 July 1965, R. Thomas; ASF S V6636-40, 28 July 1965, R. Thomas; ASF S V6646-57, 4.6 km W, 1.9 km NW Juana Díaz, 28 July 1965, R. Thomas; CM 40577-78, RT 1333-34, 4.6 km W, thence 1.9 km NW Juana Díaz, 29 July 1965, R. Thomas; UMMZ 73846, 3 mi. (4.8 km) E Juana Díaz, 27 November 1931, Chapman Grant; MCZ 36301, 10 mi. (16 km) E Juana Díaz, 27 November 1931, C. Grant; UPR 84a-b, Mayagüez, 10

December 1957, J. A. Ramos; UPR 86, Mayagüez, 8 September 1949, Nestor Nazario; UPR 91, no data.

Diagnosis: A form of *Amphisbaena* lacking fusion of head scales, of closest affinities to the species *bakeri* and *caeca*, differing from the former in having a low number of body annuli (225-234), the presence of a third row of chin segments (most specimens), and much smaller size. From *caeca* it differs in possessing a relatively longer internasal suture (32 to 53 per cent of the length of the interprefrontal suture), lack of a postmalar row of chin segments, fewer average midbody segments, caudal autotomy absent or ill-defined, and smaller size.

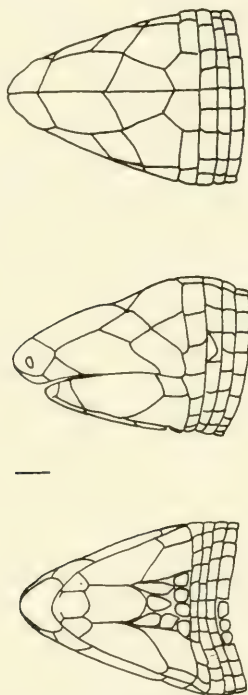


Fig. 3. Dorsal, lateral and ventral views of the head of the type of *A. xera* (MCZ 81019). Line represents 1 mm to scale.

Description of type (Fig. 3): Meristic and mensural data for type and paratypes are found in Table 1. The type is a mature adult male with the hemipenes partially everted. The first two body annuli correspond to three dorsal half-annuli; the median

segments of the second dorsal half-annulus are enlarged to form a pair of parietals in broad contact at the midline; the median segments of the third dorsal half-annulus are not enlarged to form a second pair of parietals. In the chin region two of the three segments of the first postgenial row are fused with two in the second row so that the second row is represented by only one segment (Fig. 3); the mental is partly fused with the genial. The postmalar¹ row contains four scales and is bounded laterally by the malars which abut on the first body annulus. The dorsal groove is weakly indicated by an alignment and some medial rounding of the posterior paravertebral segments.

Variation: In size, only five specimens exceed the type; 42 (90 per cent) are smaller. The head scalation described for the type is characteristic; a second pair of parietals is indicated in only four specimens. The internasal sutures range from 32 to 53 per cent of the length of the interprefrontal sutures. In the chin region the most variability is encountered in the second row of postgenials. Its scales are often variously fused with the first and third rows, or it may be represented only by one or two small and irregular scales crowded between the first and second rows. Eighteen specimens have only two postgenial rows and thereby have the chin configuration of *bakeri*. It is as if the second postgenial row were being lost. The lack of a postmalar row is characteristic; one specimen (ASF5 V6637) appears to have this row but the malar is abnormally divided. Autotomy constrictions are evident in a few specimens at the level of the fifth to seventh caudal annulus; slightly heavier pigmentation of a caudal annulus may mark the autotomy level in others. Other specimens either definitely do not have an autotomy constriction or the presence of one is indeterminate. Cloacal pores are four, with the exception of one specimen which lacks two on one side. Hemipenes are very similar to those of *bakeri* and *caeca* (Fig. 2).

Coloration: The dorsal coloration in life of this form is typically a pale tan, very reminiscent of the two living specimens of *bakeri* I have seen. The coloration lightens gradually towards the ventral surface and pigmentation is almost absent on the four ventralmost rows. Dropping out of pigmented ventral segments takes place in some specimens but is not prominent because of the fading out of all pigmentation ventrally. Dorsally

¹I have objected elsewhere (Thomas, 1965) to the use of the term postmalar; however, this was due to my misunderstanding of the terminology as it applied to *Amphisbaena innocens*.

and ventrally the coloration is darker (brownier) anteriorly. In life the venter is pink due to the translucence resulting from lack of pigmentation. The temporal region is deep reddish purple, probably another product of superficial vascularity and pigmentation. The snout (including prefrontals) is light (buffy) as is the posterior half of the edge of the lower jaw.

Comparisons and discussion: The most pertinent comparisons of *xera* are with *caeca* and *bakeri* (Fig. 4). Seven specimens, having no postmalar row of chin segments and regarded by Gans and Alexander as *A. caeca*, are here regarded as *A. xera*. Aside from one specimen I have not seen (SU 7775, examined by Gans and Alexander) which may also be referable to *xera*, and a possible exception noted above, the absence of a postmalar

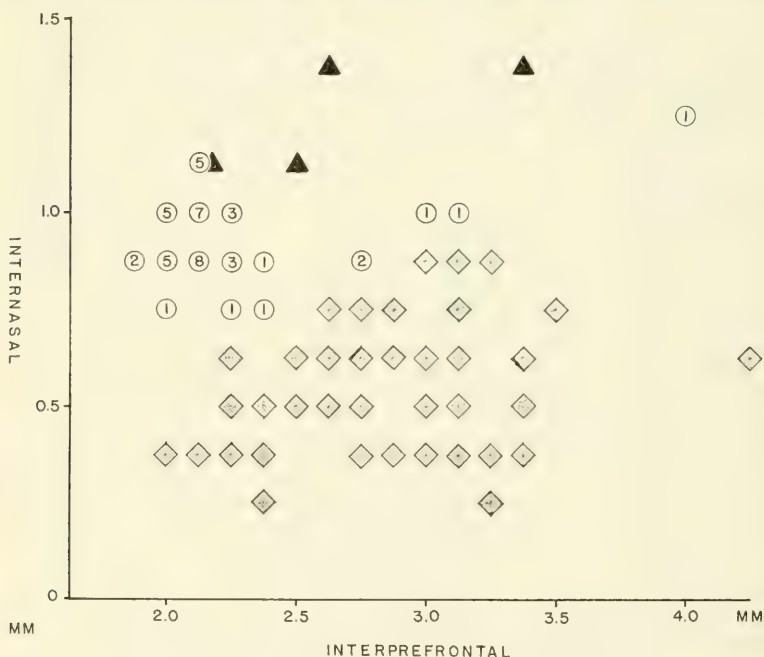


Fig. 4. Scatter diagram of internasal versus interprefrontal suture lengths for *A. caeca* (stippled squares), *A. bakeri* (solid triangles), and *A. xera* (hollow circles). Numbers in the *xera* symbols indicate the number of specimens possessing that value. Values were not plotted for all specimens of *caeca* examined, only enough to show variation including extremes. The symbols at the extreme right for *xera* and *caeca* represent the values for the largest specimen of each of these two forms.

row distinguishes *xera* from *caeca* in all cases. Internasal suture length varies from 32 to 53 per cent of the interprefrontal suture in *xera*; in *caeca* the longest interprefrontal sutures (29 per cent of the interprefrontal length) are found in four specimens from eastern Puerto Rico, where the internasal suture length averages higher than in material from the rest of the island (and interestingly an area where sympatry with the two other long internasal suture forms is absent). *A. xera* is characterized by a low number of segments around midbody; one specimen (from Mayagüez) has 32 midbody segments, otherwise the range is 26 to 30; a count of 30 or below is found in less than 20 of over 300 specimens of *caeca* examined by Gans and Alexander and by me. In the low average number of cloacal scales *xera* is more like eastern *caeca* than like those from other parts of the island. In coloration *xera* is paler than most specimens of *caeca* which are typically brown or gray-brown rather than pale (or even reddish) tan (although this color does occur in *caeca*). Specimens of *xera* are usually identifiable on first sight by their paler color and more slender proportions (*caeca* is characteristically stouter, doubtless a correlative of the greater number of midbody segments). The tails are tapered towards the tip and are not so cylindrical and rounded terminally as is typical of *caeca*; this is a distinguishing character in living specimens. The pale snout of *xera* is also not found in *caeca* (or is not so extensive).

A. caeca and *A. xera* are allopatric for the most part; they have been taken together at four localities (Mayagüez, 3 km NE San Germán, 4.6 km W, thence 4.6 km NW Juana Díaz, 2.3 km E Juana Díaz), all peripheral to the range of *xera* and apparently to that of *caeca*. At these localities there is no evidence of intergradation. Relatively short internasal sutures are found in the four Mayagüez *xera* and in the one from Sabana Grande (30 to 33 per cent of the length of the interprefrontal suture), but these do not overlap with internasal suture lengths for *caeca* from any part of the island. One Mayagüez specimen (UPR 84a) has 32 segments at midbody (16/16), the only *xera* with counts higher than 30.

A. xera is strikingly like *bakeri* in several respects (internasal suture, lack of caudal autotomy, lack of a postmalar row, pale coloration), although in others it is significantly different (fewer body annuli, size, gradual fading of color on venter). In size, 9 of the 12 known specimens of *bakeri* are larger than 42 (90 per cent) of the specimens of *xera*. The configuration of the chin segments may well be thought of as intermediate between the

conditions in *bakeri* and *cacca* but tending more towards the former. The 18 *xera* with but two postgenial rows are even more suggestive of a trend towards *bakeri*.

Schmidt (1928) commented on three specimens from Mayagüez that appeared to be intermediate between *bakeri* and *cacca*. Two of these (noted as having an internasal length of about one-half the interprefrontals) almost certainly pertained to *A. xera* (these specimens do not appear to be extant). The other specimen (CNHM 12473) was identified by Gans and Alexander as *A. bakeri*. Two specimens of *bakeri* are known from Mayagüez; one (CNHM 12473) has a body annulus count of 240, which is near the extreme low for that form; another has a count of 255 which is at the upper extreme. A specimen (UPR 7, Gans and Alexander), which has no locality data other than Puerto Rico, is probably from the Mayagüez region; it has a body annulus count of 239. It should also be recalled that three of the Mayagüez (and the one from Sabana Grande) specimens are at the upper extreme in size for *xera*. More specimens with precise data from the Mayagüez vicinity may show that *bakeri* and *xera* are subspecifically related. I am reluctant to so allocate these forms now because *bakeri* is so little known.

A. schmidtii is distinguished from *xera* by its lower number of body annuli (192-207 versus 225-234), higher number of caudal annuli (18-22 versus 10-14), the presence of caudal autotomy, larger size, different proportions, and overall darker coloration. The two are additionally distinguished by differences in relative size of some of the head scales and by different chin segment configurations.

Range: Known from the central to western parts of the southern xeric coastal plain of Puerto Rico (Fig. 1) and as far north as Mayagüez, San German, Sabana Grande, and to the northwest of Juana Díaz. In all probability it occurs on Caja de Muertos,¹ whence there are shed skins yielding midbody segment counts of 14/16 (1) or 14/14 (2) and caudal annuli of 12 (2), 13 (1) or 14 (1). The specimen recorded by Fowler (1918) from Guánica may well have been of this new form.

Habitat: The topotypical paratypes and type (7.0-7.3 km E Guánica) were collected in the xeric woods which form the more luxuriant covering of the limestone hills of this region.

¹Heatwole, Torres and Heatwole (Stahlia, 1965, no. 4, p. 1) recorded taking a specimen of *Amphisbaena* on Caja de Muertos. I have not examined this specimen, but almost certainly it pertains to *A. xera*, as it was noted to lack the postmalar row of chin segments and also agreed with *xera* in other counts given.

The soil varied from sandy with moderate organic (plant) content to loamy; there was a uniform cover of leaf litter. At the type locality, *A. xera* occurs syntopically with *Typhlops richardi* and *Typhlops granti*.

The specimen from 6.2 km E Juana Díaz was collected in a region of xeric foothills; it was found at night under a rock which was not at all imbedded in the soil. The area was exposed and had very sparse vegetation. In the heat of the day it was doubtless a most inhospitable place, and the chance of finding an *Amphisbaena* near the surface would have been negligible.

At the following three localities I was able to personally collect and observe *caeca* and *xera* together.

3 km NE San Germán. This locality is in the foothills to the north of the San Germán valley; it is transitional between the arid region to the south and the mesic highlands, but closer to the latter. The single specimen of *caeca* was collected on a boulder-strewn and somewhat wooded hillside surrounded by pasture; the specimen of *xera* was collected near a small stream at the base of the hillside. No ecological differences were discernible.

4.6 km W, thence 4.6 km NW Juana Díaz. This locality is in the valley of the Río Inabón; it too is transitional between the xeric south and the mesic interior. On the first visit, nine specimens of *caeca* and one of *xera* were found in a patch of sandy, mesic, river-border woods. The surrounding regions (where natural growth was evident) were covered by semi-arid scrubby woods; the spiny palm (*Acrocomia*), a typically semi-xeric form, was seen on some of the nearby hillsides. On the second visit an attempt was made to collect in a more open, scrubby, overgrown field nearby. Five specimens of *xera* and five of *caeca* were obtained. Not quite three kilometers to the south, another area of shady (but distinctly more xeric) riverine woods was visited. Eighteen specimens of *xera* (two of which have not been examined for this paper) were collected and no specimens of *caeca*. Less than a kilometer more to the south in still arid country, three more specimens of *xera* but no *caeca* were taken.

2.3 km E of Juana Díaz. This locality is a mesic, wooded ravine surrounded by typically xeric to semi-xeric regions. One specimen each of both species was found in the ravine.

AMPHISBAENA SCHMIDTI Gans

Specimens examined: new localities: PUERTO RICO: 5.5 mi. (9 km) N Lares, 1100' (346 m), ASFS V5197-99, V5258-60; 5 mi. (8 km) NE Lares, 1200' (366 m), ASFS V5268; 4 km S Mora, 500' (153 m), ASFS V5334; Ramey Air Force Base, Rifle Range Beach, ASFS V5432-37; 3 mi. (4.8 km) W Las Llanadas, 600' (183 m), ASFS V5871; 18.8 km SW Arecibo, 800' (244 m), ASFS V5910; 11.2 km NW Utuado, 1300' (400 m), ASFS V5923-24; 1 mi. (1.6 km) NW Dorado, ASFS V5940; 3.5 mi. (5.4 km) W Playa de Vega Baja, ASFS V5959; 2.5 km SW Florida, ASFS V5999; 5.6 km NE Morovis, 400' (122 m), ASFS V6028-29.

Amphisbaena schmidti was described (Gans, 1964) on the basis of six specimens from four more or less coastal localities, three in the northwest section of the island and one ("Salinas") presumably on the south coast. Professor Manuel J. Vélez, collector of the type and one paratype of *schmidti*, has informed me (*in litt.*) that the type locality of *A. schmidti* should correctly be "Isabela, orilla (cuneta) Carretera Caño." The locality is in the district of Isabela about six kilometers southeast of the town of Isabela by the side of Carretera Caño (= road number 113).

The distribution of *schmidti* was given as "coastal Puerto Rico." The new localities cited here are restricted to the northern limestone section (up to elevations of 1300 feet), and the species is in all likelihood endemic to this region (Fig. 1). No specimens were found elsewhere on the island.

Of the numbers of amphisbaenids collected in the southern part of Puerto Rico (*A. caeca* and *A. xera*) and of the shed skins that were often found there, none pertained to *A. schmidti*. The apparent absence of *schmidti* from the southern marginal region plus its absence from the coastal regions east of San Juan (in spite of the large series of *caeca* from there) indicate that its distribution is not coastal Puerto Rico and, at the same time, throw considerable doubt on the Salinas record. Conceivably it refers to another Salinas (a not uncommon coastal name in Latin America), possibly Punta Salinas on the north coast to the west of San Juan, which is probably in the range of *schmidti*.

The new specimens of *schmidti* agreed in coloration (in life) very closely with the coloration recorded by Gans; they were usually noted as being purplish brown dorsally with darker

brown heads and tails. The venters are heavily pigmented but sometimes pinkish. In general proportions and appearance this species is very distinct; the blunted and almost triangular head is characteristic and is accentuated by the deeply constricted neck. Indeed, this species, in proportions, color and scutellation, is possibly the most "different" of the species of the Greater Puerto Rican region. The enlarged parietals and enlarged scales at the end of the third row of chin segments are very characteristic.

Completely everted hemipenes (Fig. 2) are present in two specimens. The organs are relatively slender and deeply bilobed; the sulcus spermaticus forks in the crotch, and the apices are flattened, a condition that has been noted for *innocens* and not for *caeca* which has rounded apices (Thomas, 1965). Autotomy level varies from the sixth to eighth caudal annulus.

Different ecological preferences were observed for *schmidt*i and *caeca* in the jointly occupied parts of their ranges. *A. schmidt*i was found in more open and exposed areas, the edges of pastures, the cleared sides of gradually sloping dolines — areas where the tree cover is lacking, or high and sparse. *A. caeca*, although wider in its ecological range, prefers shady areas such as coffee groves or wooded ravine bottoms. The following table indicates briefly the type of situation in which either species was collected at particular localities within their joint range; the number of specimens at each locality is indicated in parentheses.

<i>schmidt</i> i	<i>caeca</i>
acacia scrub (6)	coastal almond (<i>Terminalia</i>) woods (2)
moderate to well-exposed, scrubby ravine sides (6)	...
moderately exposed hillside (1)	
.....	coffee grove (3)
.....	coffee grove (1)
exposed hillside pasture (2)	mesic woods adjacent to pasture (1)
high, open ravine woods (1)	exposed ravine side (1), shady ravine woods (1)
moderately exposed edge of coffee grove (1)	interior of coffee grove (1)

<i>schmidtii</i>	<i>caeca</i>
guava scrub at rim of doline pasture (1)	
.....	in coffee grove (2)
moist, open pasture (2)	
cleared slope of doline (1)	
moderately exposed roadside ditch (1)	shady coastal woods (1)
open lake margin (1)	

AMPHISBAENA FENESTRATA Cope

Specimens examined; new localities: VIRGIN ISLANDS. *St. John:* Lameshur Bay, VINP 1478; Annaberg Road near Frederickdal, VINP 1479; Caneel Hill Trail, VINP 1485; Coral Bay, VINP 1490; Windberg ruins, ASFS V7504-05; Frederickdal ruins, ASFS V7564, V8066. *Tortola:* Baugher's Bay, ASFS V7921; Jackass Gut, ASFS V7940, V7984-85, RT 977. *Virgin Gorda:* SW slope of Gorda Peak, ca. 500' (150 m), ASFS V3805-06. *Great Camanoe:* between Lee Bay and Cam Bay (shed skin). *Previously recorded localities:* *St. John:* VINP 1496-97.

In the report on *A. fenestrata* by Gans and Alexander, "Dorothea" and "West End of Great St. James" are listed in "locality records" under St. John. Dorothea is on St. Thomas and Great St. James is a small satellite island of St. Thomas.

When the data from the new specimens are placed with the old data from the various islands, the trends noted by Gans and Alexander are almost completely obliterated. The following ranges summarize the new data (data from Gans and Alexander are in parentheses):

Island	body annuli	caudal annuli	ventral segments	postloacals
St. Thomas	 (242-247)	 (12-14)	 (14-16)	... (8-10)
St. John	241-251 (247-249)	12-13 (12-14)	14-17 (14-15)	8-11 (9-10)
Tortola	243-248 (236-242)	13-14 (13-14)	14-16 (14-16)	8-11 (9-12)
Virgin Gorda	240-245	12-13	16-17	9

The shed skin from Great Camanoe is too fragmentary to yield counts. The Virgin Gorda and Great Camanoe records are the first for those islands. The two specimens from Virgin Gorda have higher dorsal midbody counts than do those of the other islands; the total midbody counts are higher than all but one of the specimens from the other islands.

Gans and Alexander have said (1962:95) that the dorsal groove in West Indian *Amphisbaena* "may be suggested by an alignment alone." However, in well-injected specimens of *A. fenestrata* the dorsal groove is structurally evident on approximately the posterior two-thirds to three-fourths of the body. The paramedian segments are rounded medially and the resulting space is occupied by "fold granules." The appearance of this groove at its fullest development is much the same as that of the lateral grooves. It becomes increasingly indistinct anteriorly and ends at the approximate level of the thirty-sixth to sixty-seventh postoral annulus. No other specimens of West Indian species seen by me (*cacca*, *schmidti*, *bakeri*, *cubana*, *innocens*, *gonavensis*, *manni*) have so prominent a dorsal groove, although one specimen of *bakeri* has a moderately well indicated dorsal groove.

Amphisbaena fenestrata inhabits islands that are preponderantly xeric; however, it prefers (or at least is most easily collected in) the most mesic areas that can be found. When we visited Virgin Gorda the weather was unseasonably dry. Shed skins of these animals were found regularly under rocks in the more shady parts of the low, xeric woods that cover much of the island. After almost a week of persistent rock turning, two specimens were obtained on a heavily wooded hillside after a heavy morning shower. *Typhlops richardi*, which was more abundantly collected in all parts of the island, was also found in moist piles of coconut husks near the coast, where *Amphisbaena fenestrata* was not. This preference for the more mesic areas was noticed also on St. John and Tortola. The presence of a soil of high organic content seems to be an important factor. A brief visit to the island of Anegada yielded no specimens or signs of amphisbaenids, although six specimens of *Typhlops* were collected.

This species is now known from the islands of St. Thomas, Great St. James, St. John, Tortola, Great Camanoe, and Virgin Gorda. Its true range is probably all of the Virgin Islands large enough to bear a suitable habitat, St. Croix excepted. Anegada is geologically distinct and well set off from the rest of the Virgins, but its fauna is not radically different; *fenestrata* may be found there.

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KEY TO GREATER PUERTO RICAN SPECIES OF *AMPHISBAENA*

1. Nasals separated by posterior extension of rostral which contacts prefrontals; body annuli 236-249 *fenestrata*
Nasals in contact with one another 2
2. Number of body annuli low (192-207); high number of caudal annuli (18-22) *schmidtii*
Number of body annuli higher (more than 214); caudal annuli lower (17 or less) 3
3. Internasal suture short (less than one-third interprefrontal suture); body annuli 214-237 *caeca*
Internasal suture long (one-third or more the length of interprefrontal suture) 4
4. Number of body annuli higher (239-255); size large *bakeri*
Number of body annuli lower (225-237), size small *xera*

TABLE 1

Meristic and mensural data for specimens of *Amphisbaena* examined. Tail and total length measurements are in millimeters. Internasal and interprefrontal suture lengths are in ocular micrometer units; one unit equals 0.125 mm. Asterisks indicate abnormality or autotomized tails.

SPECIMEN NUMBER	ANNULI	SEGMENTS												
	BODY	LATERALS	CAUDAL	DORSAL	VENTRAL	POSTGENITALS	POSTMALARS	PORES	PREOCULALS	POSTOCULALS	INTERNASAL SUTURE	INTERPREFRONTAL SUTURE	TOTAL LENGTH	TAIL LENGTH
A. BAKERI														
ASFS V5335	251+ 4	+12	16/16	3	4	-	-	4+7+11	9	20	243	12		
ASFS V6424	255+3/4+14		14/16	3	4	-	-	4+6+10	9	20	236	15		
MCZ 66512	253+ 4	+13	16/17	3	4	-	-	4+6+11	11	21	269	17		
MCZ 66513	245+ 4	+13	16/18	3	5	-	-	4+8+11	11	27	322	20		
UMMZ 55824									9	17				
A. CAECA														
ASFS V5430	229+ 3	+14	16/16	3	4	-	9	4+6+14	3	22	231	15		
ASFS V5431	226+ 3	+14	16/16	3	4	-	9	4+6+12	4	22	196	13		
UPR 84c	227+ 3	+15	16/16	3	3	5	9	4+8+13	4	24	193	13		
UPR 87	229+ 3	+16	14/16	3	4	-	9+10*	4+8+13	5	22	215	18		
UPR 88	223+ 3	+15	17/18	3	4	-	9	4+7+11	4	28	198	14		
UPR 90	227+ 3	+15	16/17	3	4	-	8	4+6+13	4	26	196	14		
UPR 92	225+ 3	+6*	16/17	3	4	-	9	4+8+12	5	23	196	14		
UPR 140	228+ 3	+15	16/16	3	4	-	9	4+6+12	5	21	170	13		
ASFS V5152	234+ 3	+14	16/18	3	4	-	8	4+8+13	3	23	206	14		
ASFS V5329	233+ 3	+15	16/18	3	2	-	8	4+8+12	6	24	202	11		
ASFS V5332	231+ 3	+15	16/18	3	4	-	8	4+8+12	6	24	225	15		
ASFS V5305	232+3/4+14		16/16	3	4	-	9	4+8+12	4	21	186	13		
ASFS V5267	225+ 3	+5*	16/18	3	4	-	9	4+8+12	4	24	206	7*		
ASFS V6407	216+ 3	+16	17/16	3	4	-	9	4+8+12	4	19	172	14		
ASFS V5908	227+ 3	+5*	16/18	3	4	-	9	4+7+12	3	25	218	7*		
ASFS V5909	221+ 3	+15	16/18	3	4	-	8	4+8+12	3	19	160	13		
ASFS V4656	221+ 3	+15	16/16	3	4	-	9	4+6+12	2	26	217	17		
ASFS V4548	229+ 4	+15	16/17	3	4	-	9	4+8+13	3	25	225	16		
ASFS V5939	227+ 3	+14	15/17	3	4	-	9	4+8+11	4	24	215	16		
ASFS V5973	232+ 3	+5*	15/18	3	1*	-	6*	4+6+12	4	20	148	5*		
ASFS V6207	231+ 3	+14	16/17	3	3	-	8	4+6+13	5	34	291	21		
ASFS V4443	232+2/3+14		14/16	3	5	-	10	4+6+12	3	18	241	16		
ASFS V4444	233+ 3	+15	16/17	3	4	-	9	4+7+13	4	27	231	16		
ASFS V4445	234+2/3+15		16/16	3	4	-	9	4+7+12	3	26	210	14		
ASFS V4446	232+ 3	+14	17/17	3	6	-	9	4+8+13	4	27	224	16		
ASFS V4447	235+ 3	+15	16/18	3	4	-	10	4+8+13	4	24	195	13		
ASFS V4448	230+ 3	+14	14/16	3	5	-	8	4+6+13	4	21	174	12		
ASFS V4449	232+ 4	+15	14/16	3	3	-	7	4+7+12	4	24	210	16		
ASFS V4482	230+ 3	+15	16/17	3	4	-	9	4+7+14	4	21	165	11		
ASFS V4499	231+ 3	+6*	14/16	3	4	-	8	4+7+13	4	27	226	7*		
ASFS V4500	230+ 3	+15	14/16	3	4	-	9	4+8+12	4	26	230	14		
ASFS V4501	229+2/3+14		15/16	3	4	-	8	4+8+14	4	21	171	11		
ASFS V4623	231+3/3+15		15/16	3	4	3*	9	4+8+13	3	24	198	15		
ASFS V5860	234+ 3	+15	16/18	3	4	-	8	4+8+12	3	26	209	15		
ASFS V5861	235+ 3	+14	14/16	3	4	-	9	4+8+13	4	20	160	10		

ASFS V5862	226+2/3+15	14/16	3	4	-	9	4+8+12	4	19	148	9
ASFS V6620	223+2/3+14	16/16	3	4	-	9	4+7+14	5	27	227	17
ASFS V6621	223+ 3 +14	16/16	3	4	-	9	4+6+12	3	27	218	15
ASFS V6622	219+ 3 +14	16/16	3	4	-	9	4+8+12	6	23	205	15
ASFS V6623	220+ 3 +14	16/17	3	4	-	9	5+8+12	2	19	205	14
ASFS V6624	226+ 3 +12	17/16	3	4	-	9	4+8+12	4	25	197	13
ASFS V6625	219+2/3+13	18/18	3	4	-	7	4+7+12	4	25	196	14
ASFS V6626	221+ 3 +14	16/16	3	4	-	9	4+8+12	5	22	145	14
ASFS V6627	221+ 3 +13	16/16	3	2	-	7	4+6+12	4	24	193	12
ASFS V6628	224+ 3 +13	16/16	3	4	-	9	4+7+13	5	23	185	13
ASFS V6631	220+ 3 +14	16/16	3	4	-	9	4+6+13	5	27	218	16
ASFS V6632	222+ 3 +14	16/16	3	4	-	9	4+7+13	4	25	202	14
ASFS V6633	222+ 3 +14	16/16	3	4	-	8	4+7+12	5	23	202	15
ASFS V6634	219+ 3 +14	16/16	3	4	-	8	4+8+12	4	24	177	13
ASFS V6635	223+2/3+14	16/16	3	4	-	9	4+8+12	5	23	191	14
ASFS V6658	220+ 3 +13	16/18	3	4	-	10	4+8+13	5	18	227	16
ASFS V6659	220+ 2 +14	16/18	3	4	-	10	4+8+13	5	23	185	13
ASFS V6660	223+ 3 +14	16/16	3	5	-	9	4+6+13	6	25	215	15
ASFS V6661	222+ 2 +14	16/18	3	6	-	10	4+7+12	6	23	210	15
ASFS V5755	225+ 4 +14	17/18	3	4	-	10	4+8+12	6	23	199	13
ASFS V5939	223+ 4 +14	14/16	3	3	-	7	4+7+13	4	23	208	14
ASFS V6027	226+3/4+12*	18/18	3	4	-	8	4+8+12	4	24	220	17
ASFS X937	224+ 4 +12	16/18	3	4	-	9	4+6+12	6	28	245	15
ASFS X938	222+ 4 +12	16/18	3	4	-	9	4+6+12	4	24	221	15
ASFS X939	226+ 3 +13	16/18	3	4	-	9	4+7+13	5	23	208	15
ASFS X940	223+3/4+13	17/18	3	4	-	9	4+6+13	5	25	214	15
ASFS X941	229+ 3 +14	16/16	3	4	-	9	4+6+12	5	24	207	14
ASFS X942	220+ 4 +13	16/18	3	4	-	9	4+6+12	4	20	177	12
ASFS X943	224+2/3+14	15/16	3	4	-	9	4+8+11	4	18	109	7
ASFS X4104	222+ 3 +14	16/17	3	4	-	9	4+6+10	4	22	214	16
ASFS X4105	225+ 4 +13	16/18	3	3	-	6	4+7+10	6	23	222	16
ASFS X4106	228+ 3 +14	16/18	3	4	-	9	4+6+12	4	23	220	15
ASFS X4107	229+ 4 +15	16/16	3	3	-	9	4+6+13	5	25	226	17
ASFS X4108	220+ 3 +13	14/16	3	4	-	9	4+6+12	6	24	205	14
ASFS X4109	223+ 3 +14	16/18	3	4	-	9	4+6+10	5	23	199	14
ASFS X4110	218+ 3 +14	16/18	3	4	-	8	4+6+13	6	23	220	16
ASFS X4111	230+3/4+13	16/16	3	4	-	8	4+6+11	7	24	227	16
ASFS X4112	223+3/4+13	16/16	3	5	-	9	4+6+12	4	24	201	13
ASFS X4113	218+ 3 +14	16/18	3	4	-	9	4+6+11	4	23	203	15
ASFS X4114	228+3/4+14	16/18	3	4	-	8	4+6+13	5	22	197	14
ASFS X4115	228+ 4 +13	16/18	3	4	-	8	4+6+12	5	24	229	16
ASFS X4116	221+ 4 +14	15/16	3	4	-	9	4+6+11	5	20	188	14
ASFS X4117	221+ 3 +11	16/16	3	6	-	7	4+6+13	5	22	194	14
ASFS X4118	228+ 4 +14	16/18	3	4	-	9	3+6+12	4	23	215	16
ASFS X4119	222+3/4+13	16/17	3	4	-	9	4+6+12	4	25		
ASFS X4120	214+ 4 +11	16/17	3	4	-	9	4+8+10	4	22	181	12
ASFS X4121	225+ 4 +14	16/18	3	4	-	8	4+6+11	5	26	227	16
ASFS X4122	226+ 4 +14	15/16	3	4	-	7	4+6+11	5	21	187	14
ASFS X4123	222+ 3 +13	15/17	3	4	-	7	4+6+11	4	19	131	7
ASFS X4124	222+ 3 +13	16/16	3	4	-	8	4+6+12	4	19	126	8
ASFS X4125	226+ 3 +14	16/18	3	4	-	9	4+6+12	5	18	113	8
ASFS X7381	225+ 4 +14	16/18	3	4	-	7	4+6+11	6	24	224	15
ASFS X7382	227+3/4+12	16/18	3	4	-	9	4+6+10	4	23	211	14
ASFS X7383	221+ 3 +14	16/18	3	4	-	9	4+8+10	5	25	222	16
ASFS X7384	229+ 3 +12	15/16	3	4	-	9	4+6+13	5	23	209	15
ASFS X7385	224+ 3 +13	16/18	3	4	-	7	4+6+11	5	22	215	13
ASFS X7386	224+ 3 +14	16/18	3	4	-	7	4+6+10	5	23	210	14
ASFS X7387	220+3/4+13*	16/18	3	4	-	9	4+6+13	6	25	214	13*
ASFS X7388	227+ 3 +14	15/18	3	4	-	9	4+7+10	5	21	195	14
ASFS X7389	224+ 4 +12	16/16	3	4	-	9	4+8+12	5	21	183	12

ASFS X7390	226+ 3 +13	15/18	3	3	-	8	4+6+12	6	23	194	13
ASFS X7391	227+3/4+13	16/19	3	4	-	9	4+6+12	3	22	189	14
ASFS X7392	227+ 4 +14	16/18	3	4	-	8	4+6+12	6	21	194	14
ASFS X7393	225+ 4 +13	17/18	3	4	-	8	4+6+12	4	22	182	13
ASFS X7394	222+ 3 +14	16/18	3	4	-	9	4+6+11	6	22	190	14
ASFS X7395	229+ 3 +13	16/18	3	4	-	9	4+6+12	4	22	190	13
ASFS X7396	227+ 3 +14	16/17	3	4	-	9	4+8+13	3	17	106	6
ASFS X7397	224+ 4 +14	16/18	3	4	-	9	4+6+11	3	18		
ASFS X7398	226+4/3+14	16/16	3	4	-	8	4+6+11	3	16	102	7
ASFS V4798	219+ 3 +15	16/16	3	4	-	9	4+9+13	3	16	238	19
ASFS V4802	232+4/2+15	16/18	3	4	-	9	4+8+13	5	24	230	16
ASFS V5081	228+ 3 +13	17/19	3	4	-	8	4+8+12	7	25	227	15
ASFS X7433	233+ 3 +14	16/18	3	4	-	8	4+6+11	7	26	226	14
ASFS X7434	229+ 3 +15	16/16	3	4	-	9	4+8+11	6	27	240	16
ASFS V6168	236+ 3 +15	14/18	3	4	-	8	4+8+12	4	19	183	13
<u>A. XERA</u>											
UPR 84a	224+ 4 +13	16/16	4	2	5	-	4+6+10	8	25	236	16
UPR 84b	221+2/3+14	14/16	3	1	4	-	4+8+10	10	32	181	14
UPR 86	224+2/3+13	14/16	3	4	5	-	4+8+11	8	24	245	18
UPR 91	234+ 3 +16	14/14	3	4	-	-		7	22	241	18
ASFS V6408	221+ 3 +13	14/14	2	2	4	-	4+6+12	7	17	168	10
ASFS V6418	220+ 3 +13	14/16	3	4	-	-	4+8+12	7	16	140	9
ASFS V6423	220+ 2 +13	14/16	4	5	-	-	4+6+13	6	18	162	11
ASFS V6427	233+ 2 +15	14/16	2	4	5	-	4+7+11	6	19	202	14
UMMZ 73844	226+ 3 +14	13/15	3	4	-	-	4+6+12	7	22	237	20
UMNH 56910	225+3/4+10	14/16	3	2	4	-	4+6+10	7	18	193	11
ASFS V5646	234+ 2 +13	14/16	3	3	4	-	4+6+8	7	17	186	12
USNM 152588	231+ 2 +14	14/16	3	4	-	-	4+6+10	6	16	170	11
ASFS V5659	225+ 3 +13	14/16	3	3	5	-	4+7+12	7	17	188	13
ASFS V5661	232+ 3 +13	14/15	3	3	4	-	4+6+10	7	17	191	12
MCZ 81019	232+ 2 +13	14/16	3	1	4	-	4+6+12	7	19	210	13
ASFS V5722	226+ 3 +13	14/16	3	4	5	-	4+6+10	8	18	190	14
ASFS V5723	231+ 2 +13	14/14	3	1	4	-	4+6+10	7	18	195	12
AMNH 94170	229+ 3 +14	14/16	2	4	4	-	4+6+10	7	16	158	12
ASFS V6616	233+ 2 +13	14/15	3	2	5	-	4+7+10	8	17	194	13
ASFS V6617	224+ 3 +14	13/15	3	2	5	-	4+8+12	7	17	175	12
ASFS V6618	228+ 3 +13	14/16	3	5	-	-	4+8+11	9	17	185	12
ASFS V6619	227+ 2 +13	14/15	3	4	-	-	4+8+12	9	17	177	12
ASFS V6636	231+ 2 +14	14/14	3	5	-	-	4+8+11	8	17	186	12
ASFS V6637	237+ 3 +14	14/14	3	4	9	-	4+8+13	7	16	187	14
ASFS V6638	234+ 2 +13	12/14	3	2	4	-	4+7+11	9	17	178	11
ASFS V6639	232+ 2 +14	14/14	3	5	-	-	4+6+11	7	17	170	11
ASFS V6640	229+2/3+13	14/15	3	4	-	-	4+8+10	7	15	162	11
ASFS V6646	230+ 2 +14	13/14	3	1	4	-	4+8+11	8	17	203	14
ASFS V6647	228+3/2+14	14/14	3	4	-	-	4+7+13	8	18	192	13
ASFS V6648	228+3/4+12	14/16	3	2	5	-	4+8+11	8	17	200	13
ASFS V6649	228+2/3+15	14/16	3	3	4	-	4+7+10	7	16	193	13
ASFS V6650	229+ 3 +13	14/14	3	3	4	-	4+8+11	8	16	191	13
ASFS V6651	234+ 3 +14	14/15	3	3	5	-	4+7+10	8	16	187	12
ASFS V6652	223+ 3 +13	14/14	3	4	-	-	4+8+10	9	17	187	13
ASFS V6653	225+ 2 +14	13/14	3	4	-	-	4+8+10	8	16	183	12
ASFS V6654	227+ 3 +13	14/16	3	2	5	-	4+8+10	7	17	186	13
ASFS V6655	229+ 3 +13	14/14	3	4	-	-	4+8+10	8	17	181	12
ASFS V6656	225+ 2 +14	14/16	3	1	3	-	4+8+11	8	17	181	12
ASFS V6657	230+ 2 +15	14/14	3	2	5	-	4+8+11	7	15	139	9
CM 40577	228+ 3 +14	14/14	3	5	-	-	4+8+9	9	17	196	14
CM 40578	225+ 2 +5*	14/15	3	3	5	-	2+8+10	7	17	180	4*
RT 1333	227+ 3 +12	14/14	3	4	-	-	4+7+11	8	16	181	11
RT 1334	228+ 2 +14	13/14	3	4	-	-	4+8+10	8	17	191	14
ASFS V6587	231+ 3 +14	14/15	3	2	5	-	4+6+12	8	18	221	15
UMMZ 73846	235+ 3 +15	14/16	3	5	-	-	4+6+11	7	16	147	11
ASFS V5800	231+ 3 +14	14/16	3	3	6	-	4+8+12	8	16	191	13
MCZ 36301	230+ 4 +13	14/14	3	4	-	-	4+7+12	7	18	189	14

A. SCHMIDTI

ASFS V5432	200+	3	+19	14/16	2	3	-	7	4+6+12	192	19
ASFS V5433	201+	3	+20	13/16	2	4	-	7	4+5+8	182	17
ASFS V5434	199+	3	+18	14/16	2	3	-	6	4+6+13	189	19
ASFS V5435	200+	3	+20	13/16	2	3	-	7	4+8+10	176	17
ASFS V5436	200+	3	+20	13/16	2	3	-	6	4+6+12	159	17
ASFS V5437	196+	3	+8*	14/16	2	3	-	7	4+6+11	138	7*
ASFS V5334	199+	3	+21	14/16	3	4	-	7	4+6+11	119	12
ASFS V5197	200+	3	+22	14/16	2	4	-	7	4+8+10	224	26
ASFS V5198	196+	3	+20	14/16	2	3	-	6	4+6+11	201	23
ASFS V5199	201+	3	+20	14/16	2	4	-	6	4+8+10	180	20
ASFS V5258	202+	3	+21	14/16	2	3	-	6	4+6+11	221	23
ASFS V5259	202+	3	+21	14/16	2	4	-	7	4+8+8	208	24
ASFS V5260	204+	3	+21	14/16	2	2	-	6	4+6+11	105	11
ASFS V5268	200+3/4	+20	16/17	3	4	-	6	4+6+11	123	13	
ASFS V5910	197+	2	+8*	14/16	2	4	-	7	4+6+11	195	11*
ASFS V5923	205+3/2	+21	14/16	2	4	-	7	4+8+9	194	21	
ASFS V5924	207+	3	+21	14/16	2	4	-	6	4+8+10	183	19
ASFS V5871	201+	4	+21	14/16	2	5	-	7	4+8+14	240	26
ASFS V5999	200+	3	+21	14/18	2	2	-	6	4+6+10	212	24
ASFS V6028	201+	3	+21	14/17	2	4	-	6	4+7+9	220	24
ASFS V6029	192+	3	+20	14/16	2	4	-	7	4+6+12	200	22
ASFS V5959	196+3/2	+20	14/17	2	3	-	6	4+6+11	137	14	
ASFS V5940	195+	3	+7*	14/16	2	1	-	6	5+6+12	200	11*

A. FENESTRATA

ASFS V7504	243+	2	+13	14/16	3	4	-	10	4+6+10	238	15
ASFS V7505	250+	2	+13	14/16	3	4	-	9	4+6+10	166	11
ASFS V7564	243+	2	+12	14/16	3	4	-	10	4+6+8	208	11
ASFS V8066	248+	2	+12	14/15	3	4	-	10	4+6+9	252	14
VINF 1478	247+	2	+13	14/16					4+6+9	250	17
VINF 1479	243+3/2	+13	14/16						4+6+10	251	18
VINF 1485	246+	2	+13	13/14					4+6+11	237	15
VINF 1490	246+3/2	+13	14/16						4+6+10	232	16
VINF 1496	251+	2	+12	14/14					4+6+11	262	16
VINF 1497	241+2/3	+12	14/17						4+6+9	232	16
ASFS V7921	247+	2	+14	14/14	3	4	-	9	4+7+8	148	10
ASFS V7940	248+	2	+13	14/14	3	4	-	9	4+7+10	230	13
ASFS V7984	243+	3	+14	14/15	3	4	-	8	4+6+9	228	13
ASFS V7985	248+	2	+14	14/16	3	4	-	9	4+6+10	226	14
HT 977	242+	2	+14	14/15	3	4	-	9	4+6+11	155	11
ASFS V3805	240+	2	+12	15/17	3	4	-	9	4+6+9	257	15
ASFS V3806	245+	3	+13	15/16	3	4	-	9	4+6+9	225	14